

# Profitable forage production of forage crops - sweet sorghum and oat

## I. Suggestion of crop rotation for forage production modes <sup>(1)</sup>

Po-Yu Chen <sup>(2)</sup> and Shyh-Rong Chang <sup>(2) (3)</sup>

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### Abstract

The insufficient supply of domestic forage drives to the demand for establishing efficient short-term forage production modes in Taiwan. This study aims to evaluate short-term forage crops with a proposal of profitable forage production of crop rotation modes in different regions. The averaged dry matter yield of sweet sorghum (*Sorghum bicolor*) reached 8,766 kg/ha. The forage quality of sweet sorghum was excellent with an average crude protein content of 10.9% and water-soluble carbohydrate of 7.1%. In particular, neutral detergent fiber and acid detergent fiber were 59.2% and 32.5%, respectively. Sweet sorghum was tolerant to flooding and drought, and was suitable for forage production in summer. The average dry matter yield in the three regions for oat “saia” (*Avena strigosa* Schreb.) was significantly the highest ( $P < 0.05$ ) with 22,980 kg/ha, followed by oat “swan” (*A. sativa* L.) with 18,210 kg/ha, and the lowest for wheat with 8,880 kg/ha, respectively. The forage yields of oats were greater than that of wheat (*Triticum aestivum* L.), so the oats could be more suitable for production in the winter in Taiwan. The dry matter yield of oat “swan” was 44,750 kg/ha, harvested 120 days after planting (DAP). The dry matter yields of oat “saia” harvested 90 and 105 DAP were significantly the highest, with 29,060 kg/ha and 31,430 kg/ha, respectively. However, the CP contents of oat “saia” were 6.7% and 11.5%, respectively. Hence, the optimum harvest period for oat “saia” was 90 - 105 DAP. For the reason, the early-maturing oat variety ‘saia’, the late-maturing oat variety ‘swan’ and sweet sorghum variety ‘Taishu No.1’ were suggested as beneficial for the forage production system in different regions. Four new modes of crop rotation for forage production were proposed as follows: A. Rice (*Oryza sativa* L.) - Sweet sorghum - Oat; B. Sweet sorghum - Manure soybean (*Glycine max* L.) - Forage corn (*Zea mays* L.); C. Manure soybean - Rice - Oat and D. Manure soybean - Sweet sorghum - Oat. Mode B and D were entirely forage crop rotation systems.

Key words: Forage, Sweet sorghum, Oat, Crop rotation mode.

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(2) Forage Crops Division, COA-LRI, Tainan 71246, Taiwan, R. O. C.

(3) Corresponding author, E-mail: srchang@mail.tlri.gov.tw